

REMARKS

All claims stand rejected either under 35 U.S.C. 102(e) as being anticipated by Ichinose et al. (U.S. Patent No. 6,481,805), or under 35 U.S.C. 103(a) as being unpatentable over Ichinose et al. in view of Karnopp et al. (U.S. Patent No. 4,852,699). Applicant respectfully asks the Examiner to reconsider these rejections in view of the following Remarks.

Applicant has presented detailed Arguments in its Response filed on October 27, 2006, and refers the Examiner thereto for a more complete analysis rather than repeating the Arguments herein. Instead, Applicant herein attempts to clarify the perceived confusion that appears to exist with respect to those Arguments.

In summary, all claims require, among other elements, (i) a position sensor which produces a current position signal indicative of a current position a moveable brake component, (ii) a position indicative command indicative of a commanded position to which the at least one moveable brake component is to be moved in order to achieve a demanded level of braking, and (iii) a brake controller which causes application of a brake actuator based at least in part upon a comparison of the position indicative command with the current position signal.

It is Applicant's position that Ichinose et al. does not ever determine a position indicative command indicative of a commanded position to which the at least one moveable brake component is to be moved in order to achieve a demanded level of braking. Instead, the only time position is employed by Ichinose et al. is in connection with a known "contact position" which is used to determine when to slow brake pad advance so as to soften initial contact between the pads 2 and the disc 3. This "contact position" is not a *commanded* position to which at least one moveable brake component is to be moved *in order to achieve a demanded level of braking*. In fact, at the known "contact position", there is no braking being applied at all (since it is the position where the pad is just about to contact the disc), never mind the position where a *demanded level of braking* is achieved.

It is also Applicant's position that Ichinose does not disclose a brake controller which causes application of a brake actuator based at least in part upon a comparison of the position indicative command with a current position signal. Rather, the brake controller of Ichinose et al. controls application of the brake actuator based upon a comparison of a *commanded brake force* and a *current brake force* determined using brake force sensors (in the form of a motor current detector 88 in some embodiments and in the form of a flow rate detector 47 or pressure sensor 46 in other embodiments).

A simplified hypothetical example of the claimed invention and the Ichinose et al. system is now presented in attempts to clarify these differences.

Suppose that using the claimed invention, a brake force of $F=50$ is desired and the brake component is initially in an at-rest position. The system determines that in order to achieve a brake force of $F=50$, the brake component must be moved to a position $x=10$. Thus, $x=10$ is the claimed commanded position to which the at least one moveable brake component is to be moved in order to achieve a demanded level of braking. Now, suppose that initially the position of the brake component is determined, by the claimed position sensor, to be at position $x=2$ (which would be the initial claimed current brake position). The commanded brake component position ($x=10$) is compared with the current brake component position ($x=2$) and it is determined that the brake needs to be actuated. The brake is actuated, and after a time interval, the current position of the brake component, as sensed by the position sensor, is now $x=4$. The commanded brake component position ($x=10$) is compared with the current brake component position ($x=4$) and it is determined that the brake needs to be further actuated. This is repeated until the current brake component position reaches $x=10$, whereupon, since the comparison reveals that the commanded brake component position

($x=10$) now equals the current brake component position ($x=10$), as sensed by the position sensor, it is determined that further actuation is not required.

Now suppose that using the Ichinose et al. system, a brake force of $F=50$ is desired, and the brake component is initially in an at-rest position. The brake force $F=50$ would be the commanded brake force. The system moves the brake pad, initially at a faster rate, to the known "contact position", and then slows movement of the brake pad as the brake pad contacts the disc. The current brake force, as sensed using a force sensor, would still be $F=0$ at this point. Now, the system compares the commanded brake force $F=50$ with a current brake force $F=0$, and determines that the brake needs to be actuated (i.e., moved further). The brake is actuated, and after a time interval, the current brake force, as sensed by the force sensor, is now $F=10$. The commanded brake force ($F=50$) is compared with the current brake force ($F=10$) and it is determined that the brake needs to be further actuated (i.e., moved). This is repeated until the current brake force reaches $F=50$, whereupon, since the comparison reveals that the commanded brake force ($F=50$) now equals the current brake force ($F=50$), as sensed by the force sensor, it is determined that further actuation is not required.

Thus, it should be readily apparent that in the Ichinose et al. system, no position indicative command indicative of a commanded position to which the at

least one moveable brake component is to be moved in order to achieve a demanded level of braking is ever determined. While the brake pad is obviously at *some* position when the demanded level of braking (i.e., $F=50$) is achieved, this position is never even known to the system. The only position which is known to the system is the "contact position". However, at this position, there is no force at all being exerted, never mind a force necessary to achieve the demanded level of braking. Moreover, the only comparison performed by the Ichinose et al. system is a comparison between the commanded *brake force* and the current sensed *brake force*, not a comparison between a commanded brake component position and a current brake component position, as is claimed.

Applicant would like to further clarify one issue raised by the Examiner in the outstanding Office Action mailed on January 12, 2007. Specifically, the Examiner has stated that:

Applicant appears to disagree with the contact position being the commanded position because the contact position is known. It is unclear to the Examiner why Applicant is suggesting that a known position cannot be a commanded position.

It should be clarified that Applicant has never meant to suggest that a known position cannot be a commanded position. Applicant is simply suggesting that there is a difference between a known position and a commanded position, and that just because a position of something is known does not mean that the

thing is in a commanded position. Using the Examiner's own analogy, suppose that an officer happens upon a driver already pulled to the side of the road. While the position of the driver (i.e., the side of the road) is known to the officer, it can not reasonably be said that the position of the driver (i.e., the side of the road) is a commanded position, since the officer did not command the driver to move there. In the present case, while the "contact position" is known in the system of Ichinose et al., Applicant contends that it can not be said that this position is a commanded position to which the at least one moveable brake component is commanded to be moved in order to achieve a demanded level of braking, as is required by all currently pending claims.

For the foregoing reasons, Applicant respectfully submits that all pending claims, namely Claims 1-45, are patentable over the references of record, and earnestly solicits allowance of the same.

Respectfully submitted,



Wesley W. Whitmyer, Jr., Reg. No. 33,558
Todd M. Oberdick, Reg. No. 44,268
ST. ONGE STEWARD JOHNSTON & REENS LLC
986 Bedford Street
Stamford, Connecticut 06905-5619
(203) 324-6155
Attorneys for Applicant